IBM System x3630 M3

IBM Redbooks Product Guide

The IBM® System x3630 M3 is a storage-rich dual-socket 2U server that integrates the leadership features of traditional enterprise server offerings with affordable components to deliver outstanding value to cost-conscious buyers. Based on the Intel Xeon 5600 processor technology, the x3630 M3 offers high performance and maximum storage capacity. It provides up to 28 TB of internal storage capacity for a much lower cost per terabyte than external storage, making it an ideal solution for storage-intensive workloads.

The x3630 M3 helps keep your business running smoothly with availability features that include redundant cooling fan modules and hot-swap/redundant power supplies, RAID protection, and predictive failure analysis. The x3630 M3 also offers a comprehensive suite of systems management tools that help simplify management tasks.

Suggested uses: Web 2.0 applications like online gaming, video/photo sharing, mail serving, community, messaging, web search, file/print, backup, imagery, and transactional data server.

Figure 1. The IBM System x3630 M3

Did you know?

The x3630 M3 is the best choice to maximize internal storage. With support for up to 14 hot-swap 3.5-inch SAS or SATA disk drives, the server can house up to 44 TB of local storage. In addition, comprehensive systems management tools such as the built-in integrated management module, light path diagnostics, Predictive Failure Analysis, and support for IBM Systems Director make it easy to deploy, integrate, service, and manage the server.

Key features

The challenge of a high-performance business is to do more with less–serve more Web pages, handle more secure connections, support more email users. You need to reduce the costs of doing business and improve the service you deliver to your customers while lowering your overall risk. The dual-socket IBM System x3630 M3 can reduce your costs with its new energy-smart design. It can improve service with reduced operational complexity and increased management functionality. It will lower your IT risk with the resiliency that comes from having no single point of failure. And like all IBM servers, the x3630 M3 offers you the trust that comes from IBM global reach, service, and support.

The x3630 M3 is a high-performance rack server that uses significantly less power than previous generations, with unified systems management tools, leading reliability, availability, and serviceability features, and broad system flexibility, housed in a compact 2U mechanical package.

Performance

The x3630 M3 offers numerous features to boost performance and reduce costs:

- Up to two 6-core Xeon 5600 series processors offering superior performance. Xeon 5600 series processors offer up to 54% better performance than the previous generation 5500 series processors (workload dependent).
- 12 DIMMs of registered 1333 MHz DDR3 ECC memory provide speed, high availability, and a memory capacity of up to 192 GB with 16 GB DDR3 RDIMMs.
- Support for 15K RPM SAS disk drives to maximize disk I/O performance and throughput.
- High-performance 6 Gbps SAS RAID controllers and 15K RPM 6 Gbps SAS disk drives in a variety of capacities to suit your local storage requirements.

Flexibility and scalability

The x3630 M3 has the ability to grow with your application requirements with these features:

- A choice of 4-core or 6-core processors with clock rates from 1.6 GHz to 3.20 GHz.
- 12 DIMM sockets allowing memory expansion of up to 192 GB.
- Five USB 2.0 ports available - two front, two rear, one internal for an embedded hypervisor.
- Storage bay flexibility: Up to 14 hot-swap 3.5" drive bays for SAS or SATA HDDs (12 accessible from the front and two accessible from the rear). Alternatively, up to 28 hot-swap 2.5" drive bays for HDDs or SSDs (24 accessible from the front and four accessible from the rear)
- Direct-attach SAS storage with the EXP2512, EXP2524, and EXP3000 storage enclosures is supported. IBM System Storage servers, including network-attached storage (NAS), and iSCSI or Fibre Channel-attached storage, can also be attached.
- The x3630 M3 provides two PCI Express (PCIe) 2.0 I/O slots for increased network or storage connectivity.

Manageability and security

Powerful systems management features simplify local and remote management of the server:

- The server includes an Integrated Management Module (IMM) to monitor server availability, perform Predictive Failure Analysis, and trigger IBM Systems Director alerts.

- An optional Virtual Media Key enables additional systems management capabilities, including web-based out-of-band remote control (keyboard video and mouse), remote optical drive support, Windows “blue screen” error capture, and support for LDAP and SSL protocols.
- Text Console Redirection support allows the administrator to remotely view console text messages over Serial or LAN connections.
- Integrated industry-standard Unified Extensible Firmware Interface (UEFI) next-generation BIOS. New capabilities include:
  - Human readable event logs — no more beep codes
  - Complete out-of-band coverage by the Advance Settings Utility to simplify remote setup
  - A complete setup solution, allowing adapter configuration functions to be moved into UEFI
  - Consistent firmware management across an entire product line
- Integrated IPMI 2.0 support alerts IBM Systems Director to anomalous environmental factors, such as voltage and thermal conditions. It also supports highly secure remote power control using data encryption.
- IBM Systems Director is included for proactive systems management. IBM Systems Director comes with a portfolio of tools, including IBM Systems Director Active Energy Manager, IBM Service and Support Manager, and others. IBM Systems Director also offers extended systems management tools for additional server management and increased availability. When a problem is encountered, IBM Systems Director can issue administrator alerts via email, pager, and other methods.
- IBM Systems Director Active Energy Manager provides advanced power management features with actual real-time energy monitoring, reporting, and capping features.

Availability and serviceability

The System x3630 M3 provides many features to simplify serviceability and increase system uptime:

- The server offers Chipkill ECC memory protection (when using x4 DIMMs). Chipkill memory is up to 16 times better than standard ECC memory at correcting memory errors. This can help reduce downtime caused by memory errors.
- The server offers memory mirroring for redundancy in the event of a non-correctable memory failure.
- Toolless cover removal provides easy access to upgrades and serviceable parts, such as HDDs and memory. Similarly, the Virtual Media Key and the ServeRAID controller can be installed and replaced without tools. This means less time (and therefore less money) spent servicing the server.
- The server offers hot-swap and redundant power supplies and hot-swap disk drives (redundant when implemented in conjunction with a RAID controller). These features mean greater system uptime.
- Toolless slides ship with the server that allow the rack server to easily slide into place.
- The light path diagnostics panel and individual light path LEDs quickly lead the technician to failed (or failing) components. This simplifies servicing, speeds up problem resolution, and helps improve system availability.
- The three-year (parts and labor) limited onsite warranty provides peace of mind and greater investment protection than a one-year warranty does.

Energy efficiency

The System x3630 M3 has an energy-efficient design with features including the following:

- Low-voltage processors draw less energy and produce less waste heat than high-voltage processors, thus helping to reduce data center energy costs. Available 4-core Xeon 5600 series processors use only 40 W and 6-core processors consume as little as 60 W.

- Support for 1.35 V low-voltage DDR3 memory DIMMs that consume 20% less energy.
- Energy-efficient components, including low-voltage transistors and voltage regulator modules, and power supplies that are up to 90% efficient.
- Available 675 W high-efficiency power supply with 90%+ efficiency.
- The server uses hexagonal ventilation holes in the chassis. Hexagonal holes can be grouped more densely than round holes, providing more efficient airflow through the system chassis. This ultimately results in reduced operational costs.
- An altimeter works in conjunction with the IMM to govern fan rotation based on the readings that it delivers. This saves money under normal conditions because the fans do not have to spin at high speed.

Locations of key components and connectors

Figure 2 shows the front of the models with 2.5-inch drives (top) and 3.5-inch drives (bottom).

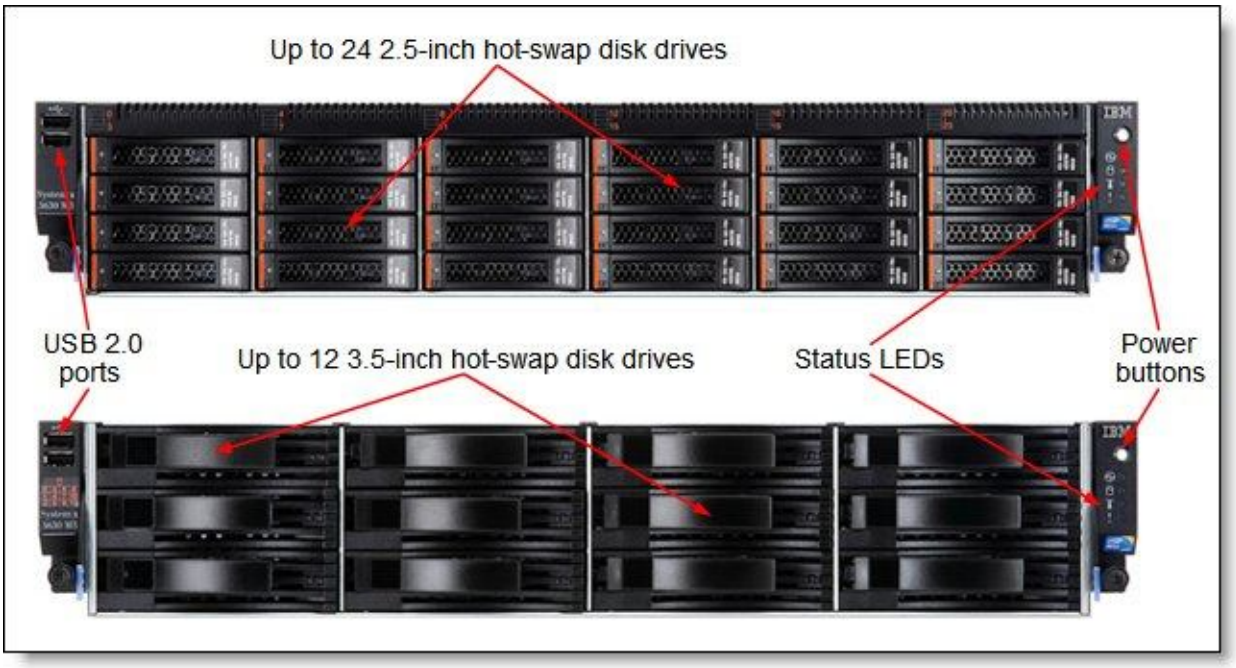

Figure 2. System x3630 M3 - Front view

Figure 3 shows the rear of the server. Either four 2.5-inch hot-swap drives (as shown) or two 3.5-inch hot-swap drives can be installed using one of the optional rear hot-swap SAS/SATA hard disk drive cages.

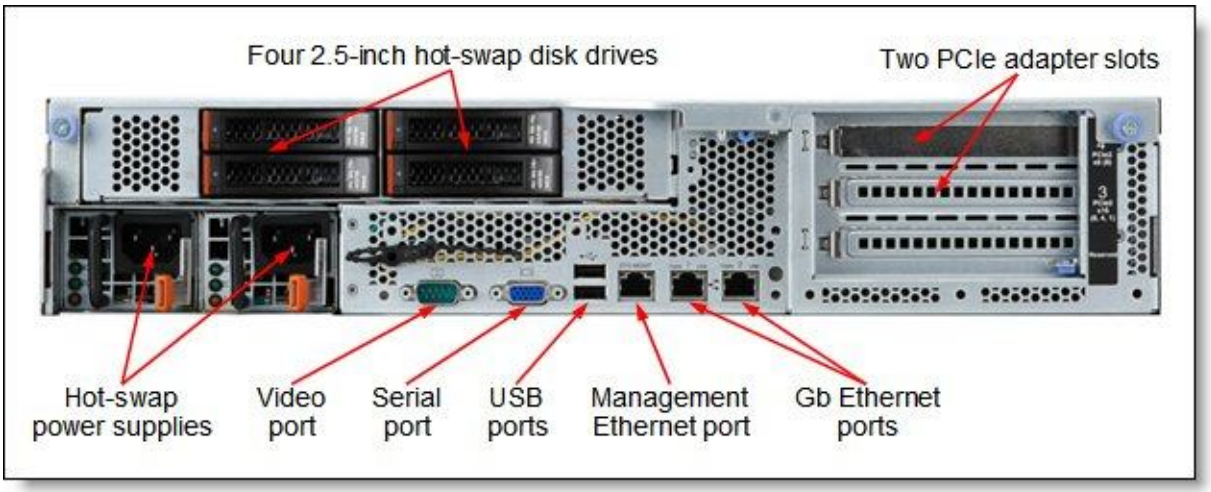

Figure 3. System x3630 M3 - Rear view

Figure 4 shows the locations of key components inside the server. The front hot-swap drive bays are not shown.

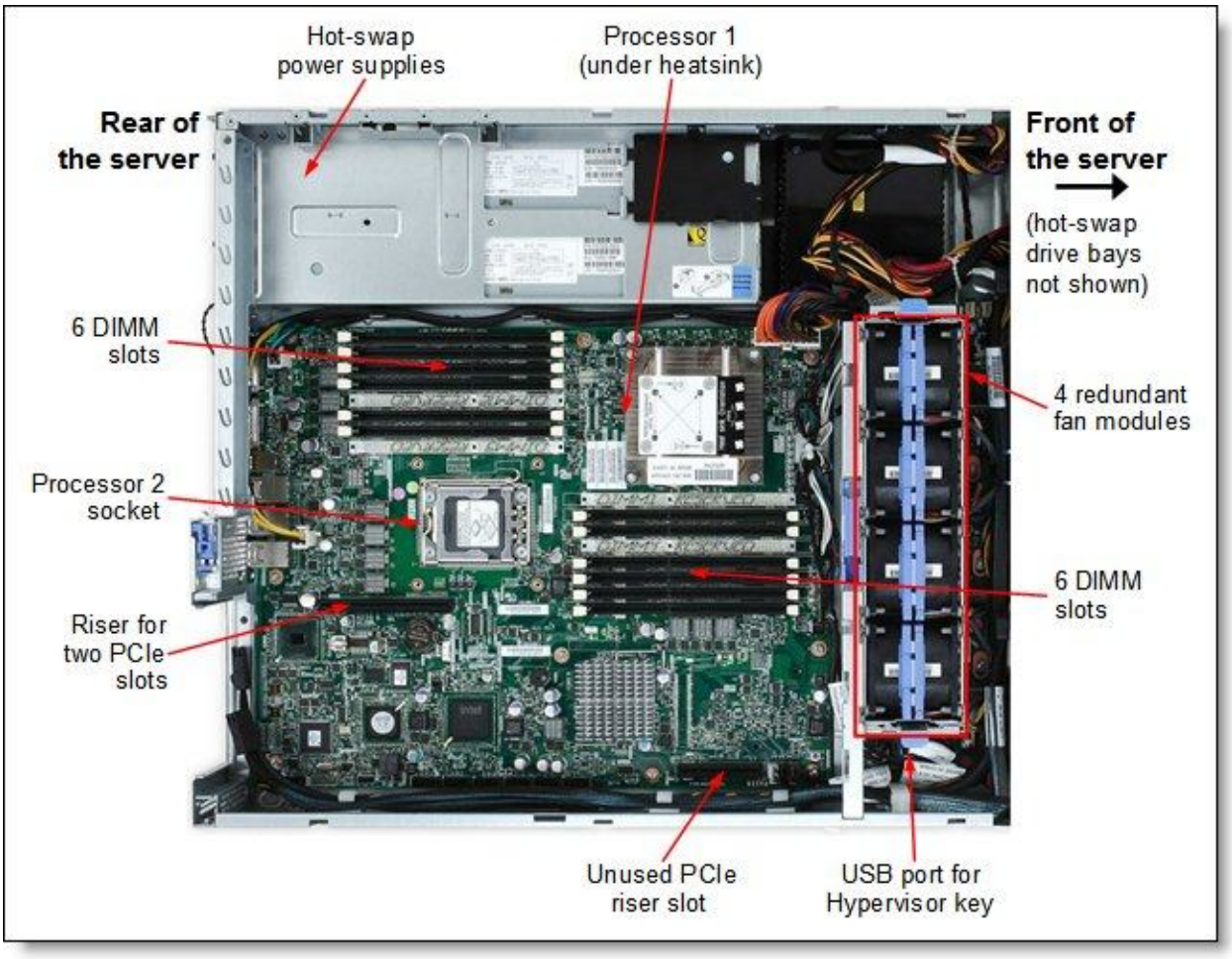

Figure 4. System x3630 M3 - Inside view

Standard specifications

Table 1. Standard specifications (part 1)

Components	Specification
Form factor	2U rack.
Processor	Up to two six-core (up to 3.06 GHz) or quad-core (up to 3.2 GHz) Intel Xeon 5600 series processors with QuickPath Interconnect technology up to 6.4 GT/s, and up to 1333 MHz memory speed. Up to two four-core (up to 2.26 GHz) or dual-core (2.0 GHz) Intel Xeon 5500 series processors.
Memory cache	Up to 12 MB L3 for Intel Xeon 5600 series processors. Up to 4 MB L3 for Intel Xeon 5500 series processors.
Chipset	Intel 5500.
Memory DIMM slots	12 DDR3 DIMM slots (6 per installed processor).
Memory capacity	Up to 192 GB with 16 GB DDR3 RDIMMs and 12 populated DIMM slots (up to 96 GB with six DIMMs per processor).
Memory protection	ECC, ChipKill (for x4-based memory DIMMs), and Memory Mirroring.
Disk drive bays	Up to 14 hot-swap 3.5-inch SAS/SATA HDDs, or up to 28 hot-swap 2.5-inch SAS/SATA HDDs.
Maximum internal storage	Up to 33.6 TB with 1.2 TB 2.5" SAS HDDs, or up to 44.8 TB with 1.6 TB SAS HDDs, or up to 42 TB with 3 TB 3.5" HDDs. Intermix of SAS/SATA is supported.
RAID support	RAID 0, 1, 1E with ServeRAID M1015. Optional upgrade to RAID-5. RAID 0, 1, 5, 10, 50 with ServeRAID M5014 or M5015. Optional upgrade to RAID 6 and 60.
Optical drive bays	None.
Tape drive bays	None.
Network interfaces	Integrated 2-port Gigabit Ethernet.
PCI Expansion slots	Two PCI Express 2.0 slots: ● One PCI Express 2.0 x16 (x8 wired) ● One PCI Express 2.0 x8 (x8 wired) (for the standard ServeRAID controller)
External ports	Front: Two USB 2.0 ports. Rear: Two USB 2.0, one DB-15 video, one DB-9 serial, one RJ-45 systems management, two RJ-45 Gigabit Ethernet network ports. Internal: One internal USB port for embedded hypervisor.
Cooling	IBM Calibrated Vectored Cooling™ with four counter-rotating non-hot-swap fans with N+1 redundancy.
Power supply	Up to two redundant hot-swap 675 W AC or 675 W high-efficiency (HE) AC power supplies with 90%+ efficiency.
Hot-swap components	Hard drives, power supplies.
Systems management	UEFI, IBM Integrated Management Module (IMM), Predictive Failure Analysis, Light Path Diagnostics, Automatic Server Restart, IBM Systems Director* and IBM Systems Director Active Energy Manager™, IBM ServerGuide. Optional Virtual Media Key for remote presence (graphics, keyboard and mouse, virtual media).
Security features	Power-on password, administrator's password.

Table 1. Standard specifications (part 2)

Components	Specification
Video	Matrox G200eV with 16 MB memory integrated into the IMM. Maximum resolution is 1280x1024 at 75 Hz with 16M colors.
Operating systems supported	Microsoft Windows Server 2003/2003 R2, 2008/2008R2, Microsoft Windows Small Business Server, Red Hat Enterprise Linux 5 and 6, SUSE Linux Enterprise Server 10 and 11, VMware ESX 4/4.1 and VMware ESXi 4/4.1 embedded hypervisor.
Limited warranty	Three-year customer-replaceable unit and onsite limited warranty with 9x5 next-business-day response time.
Service and support	Optional service upgrades are available through IBM ServicePacs®: 24x7 with next business day or 4 hours onsite repair, 1-year or 2-year warranty extension, remote technical support for IBM hardware and selected IBM and third-party (Microsoft, Linux, VMware) software.
Dimensions	Width: 488 mm (19.2 in), depth: 749 mm (29.5 in), height: 87 mm (3.4 in)
Weight	Minimum configuration: 16.20 kg (35.68 lb), maximum configuration: 29.20 kg (64.32 lb)

* Effective October 12, 2012, or until supply is depleted, IBM will discontinue the shipment of IBM Systems Director DVDs with IBM System x servers and IBM BladeCenter chassis. IBM Systems Director Express Edition and IBM Systems Director Standard Edition, which include software subscription and support, continue to be available for IBM System x servers and IBM Blade Centers.

The x3630 M3 servers are shipped with the following items:

- Statement of Limited Warranty
- Important Notices
- Rack Installation Instructions
- Documentation CD that contains the *Installation and User's Guide*
- Slides Kit
- One 2.8 m C13 - C14 power cord

Standard models

The following table lists the standard models. Model C4x is preloaded with Windows Storage Server 2008 R2 Standard Edition.

Table 2. Standard models

Model	Processor (2 maximum)*	Memory	RAID adapter	Disk bays‡	Disks	Network	Optical	Power Supply (W)
Models announced January 2012								
7377-C4x†	1x Xeon E5620 2.40 GHz 4C 1 2MB 1066 MHz	1x 8 GB	M5015 + Battery	24x 2.5" HS (28 max)	1x 300 GB 10K 2.5" HS HDD†	2x GbE	None	2x 675 High Eff.
Models announced February 2011								
7377-A2x	1x Xeon E5603 1.60 GHz 4C 4 MB 1066 MHz	1x 4 GB	M1015	12x 3.5" HS (14 max)	Optional	2x GbE	None	1x 675
7377-B2x	1x Xeon E5607 2.26 GHz 4C 8 MB 1066 MHz	1x 4 GB	M1015	12x 3.5" HS (14 max)	Optional	2x GbE	None	1x 675
7377-C2x	1x Xeon E5620 2.40 GHz 4C 1 2MB 1066 MHz	1x 4 GB	M5014	24x 2.5" HS (28 max)	Optional	2x GbE	None	1x 675
7377-D2x	1x Xeon E5645 2.40 GHz 6C 12 MB 1333 MHz	1x 4 GB	M5014	12x 3.5" HS (14 max)	Optional	2x GbE	None	1x 675
7377-F2x	1x Xeon E5649 2.53 GHz 6C 12 MB 1333 MHz	1x 4 GB	M5014	24x 2.5" HS (28 max)	Optional	2x GbE	None	1x 675
7377-64x	1x Xeon X5650 2.66 GHz 6C 12 MB 1333 MHz	1x 4 GB	M5015 + Battery	12x 3.5" HS (14 max)	Optional	2x GbE	None	1x 675
7377-G2x	1x Xeon X5675 3.06 GHz 6C 12 MB 1333 MHz	1x 4 GB	M5015 + Battery	24x 2.5" HS (28 max)	Optional	2x GbE	None	1x 675

* In the processor column: standard quantity of processors, processor model, core speed, cores, L3 cache, memory speed

‡ The standard disk bays are in the front of the server. The rear disk bays are optional with the addition of a hot-swap SAS/SATA rear hard disk drive cage

† Model C4x is preloaded with Microsoft Windows Storage Server 2008 R2 Standard Edition

Refer to the Specifications section for information about standard features of the server.

Express models

Express models are preconfigured with additional components such as processors, memory, and disks with the purpose of making the ordering and installation process simpler.

Table 3. Express models

Model	Processor (2 maximum)*	Memory	RAID adapter	Disk bays‡	Disks	Network	Optical	Power supply
NA								
7377-E1U†	1x Xeon E5620 2.40 GHz 4C 12 MB 1066 MHz	6x 2 GB	M5015 + Battery	12x 3.5" HS (14 max)	4x 1 TB	2x GbE	No	2x 675 W
7377-E2U†	1x Xeon E5620 2.40 GHz 4C 12 MB 1066 MHz	5x 4 GB	M5015 + Battery	12x 3.5" HS (14 max)	6x 1 TB	2x GbE	No	2x 675 W
Latin America								
7377-E1U	1x Xeon E5620 2.40 GHz 4C 12 MB 1066 MHz	6x 2 GB	M5015 + Battery	12x 3.5" HS (14 max)	4x 1 TB	2x GbE	No	2x 675 W
7377-E2U	1x Xeon E5620 2.40 GHz 4C 12 MB 1066 MHz	6x 4 GB	M5015 + Battery	12x 3.5" HS (14 max)	6x 1 TB	2x GbE	No	2x 675 W
7377-42U	1x Xeon E5630 2.53 GHz 4C 12 MB 1333 MHz	1x 4 GB	M5014	12x 3.5" HS (14 max)	Optional	2x GbE	No	1x 675 W
7377-D2U	1x Xeon E5645 2.40 GHz 6C 12 MB 1333 MHz	1x 4 GB	M5014	12x 3.5" HS (14 max)	Optional	2x GbE	No	1x 675 W
7377-64U	1x Xeon E5650 2.66 GHz 6C 12 MB 1333 MHz	1x 4 GB	M5015 + Battery	12x 3.5" HS (14 max)	Optional	2x GbE	No	1x 675 W
RCIS								
7377-K1G	1x Xeon E5606 2.13 GHz 4C 8 MB 1066 MHz	1x 4 GB	M5015 + Battery	12x 3.5" HS (14 max)	Optional	2x GbE	Multiburner	1x 675 W
7377-K2G	1x Xeon E5620 2.40 GHz 4C 12 MB 1066 MHz	1x 4 GB	M5015 + Battery	12x 3.5" HS (14 max)	Optional	2x GbE	Multiburner	1x 675 W

* In the processor column: standard quantity of processors, processor model, core speed, cores, L3 cache, memory speed.
‡ The standard disk bays are in the front of the server. The rear disk bays are optional with the addition of a rear hot-swap SAS/SATA rear hard disk drive cage.
† Withdrawn from marketing 31 December, 2012.

Processor options

The server supports up to two processors. The following table shows which server models have each processor standard and lists the additional processor options supported by this server. If there is no corresponding *where-used* model for a particular processor, then this processor is only available through CTO.

Table 4. Processor options

Part number	Feature code	Description	Models where used
Intel Xeon 5600 series processors			
81Y6703	A135	Intel Xeon E5603 4C 1.60GHz 4MB 1066MHz 80w	A2x
81Y6704	A136	Intel Xeon E5606 4C 2.13GHz 8MB 1066MHz 80w	-
81Y6705	A137	Intel Xeon E5607 4C 2.26GHz 8MB 1066MHz 80w	B2x
69Y1225	4620	Intel Xeon E5620 4C 2.40GHz 12MB 1066MHz 80w	C2x, C4x, E1U, E2U
69Y1357	7716	Intel Xeon E5630 4C 2.53GHz 12MB 1066MHz 80w	42x
69Y1358	7717	Intel Xeon E5640 4C 2.66GHz 12MB 1066MHz 80w	52x
81Y6707	A139	Intel Xeon E5645 6C 2.40GHz 12MB 1333MHz 80w	D2x
81Y6708	A13A	Intel Xeon E5649 6C 2.53GHz 12MB 1333MHz 80w	F2x
81Y6713	A13F	Intel Xeon L5609 4C 1.86GHz 12MB 1066MHz 40w	-
69Y1359	7718	Intel Xeon L5630 4C 2.13GHz 12MB 1066MHz 40w	-
69Y1227	4622	Intel Xeon L5640 6C 2.26GHz 12MB 1333MHz 60w	-
69Y1229	4624	Intel Xeon X5650 6C 2.66GHz 12MB 1333MHz 95w	62x, 64x
81Y6710	A13C	Intel Xeon X5660 6C 2.80GHz 12MB 1333MHz 95w	-
69Y1231	4626	Intel Xeon X5670 6C 2.93GHz 12MB 1333MHz 95w	72x
81Y6712	A13E	Intel Xeon X5672 4C 3.20GHz 12MB 1333MHz 95w	-
81Y6711	A13D	Intel Xeon X5675 6C 3.06GHz 12MB 1333MHz 95w	G2x
Intel Xeon 5500 series processors			
69Y5251	A134	Intel Xeon E5503 2C 2.0GHz 4MB 800MHz 80w	-
69Y1217	4612	Intel Xeon E5506 4C 2.13GHz 4MB 800MHz 80w	22x

Memory options

IBM DDR3 memory is compatibility tested and tuned for optimal System x performance and throughput. IBM memory specifications are integrated into the light path diagnostics for immediate system performance feedback and optimum system uptime. From a service and support standpoint, IBM memory automatically assumes the IBM system warranty, and IBM provides service and support worldwide.

The server supports 12 DIMM slots. When one processor is installed, then only six DIMM slots can be used. When two processors are installed, then all 12 DIMM slots can be used. The server supports single-rank, dual-rank, and quad-rank RDIMMs. The maximum amount of memory is achieved when two processors are installed and 16 GB quad-rank RDIMMs are used for a total of 192 GB (96 GB per CPU).

Each CPU has three memory channels and there are two DIMMs per channel. Maximum memory speed is limited by memory speed supported by the specific processor and by the number and type of DIMMs installed (whichever has a lower memory speed rating), as follows:

- Intel Xeon 5600 series processors:
  - 1333 MHz when one or two single-rank or dual-rank RDIMMs per channel are installed
  - 1066 MHz when one quad-rank RDIMM per channel is installed
  - 800 MHz when two quad-rank RDIMMs per channel are installed
- Intel Xeon 5500 series processors: Quad-core and dual-core processors in the x3630 M3 only support memory speed at 800 MHz.

The server supports both 1.5 V and 1.35 V DIMMs. However, mixing the DIMMs with different voltage is not supported. Only systems with Intel Xeon 5600 series processors support the 1.35 V DIMMs.

The following memory protection technologies are supported:

- ECC
- ChipKill (for x4-based RDIMMs)
- Memory mirroring

If memory mirroring is used then DIMMs must be installed in pairs (minimum of one pair per each CPU), and both DIMMs in a pair must be identical in type and size.

The following table lists memory options available for the x3630 M3 server.

Table 5. Memory options

Part number	Feature code	Description	Maximum supported	Standard models where used
49Y1405	8940	2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	12	-
49Y1406	8941	4GB (1x4GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	12	A2x, B2x, C2x, D2x, F2x, 64x, G2x
49Y1407	8942	4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	12	-
49Y1397	8923	8GB (1x8GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	12	C4x
49Y1400	8939	16GB (1x16GB, 4Rx4, 1.35V) PC3L-8500 CL7 ECC DDR3 1066MHz LP RDIMM	12	-

Internal storage

The IBM System x3630 M3 models come standard with one of the following internal disk storage configurations:

- 12x 3.5-inch hot-swap SAS/SATA hard drive bays at the front of the server
- 24x 2.5-inch hot-swap SAS/SATA hard drive bays at the front of the server

In addition, the server supports hot-swap drives at the rear of the server (Figure 3):

- For models with 3.5-inch drives at the front, two extra 3.5-inch hot-swap hard drive bays
- For models with 2.5-inch drives at the front, four extra 2.5-inch hot-swap hard drive bays

The following table lists the two rear hot-swap cage assemblies needed to support disk drives at the rear of the server. The same drives that are supported in the front bays are also supported in the rear bays (see the *Disk drive options* table).

Table 6. Internal storage expansion options

Part number	Feature code	Description	Maximum supported
69Y1527	4188	2.5-inch Hot Swap Cage Assembly, Rear, 4x 2.5"	1
69Y1511	4186	3.5-inch Hot Swap Cage Assembly, Rear, 2x 3.5"	1

The backplane for the rear hot-swap drives is connected via a SAS cable to the backplane of the front hot-swap bays. This cable (and other cables and mounting hardware) is included with the assemblies listed in the Internal storage expansion options table.

Controllers for internal storage

The following table lists the RAID controllers and additional options used for internal disk storage of the x3630 M3 server.

Table 8. RAID controllers for internal storage

Part number	Feature code	Description	Maximum supported	Standard models where used
46M0831	0095	ServeRAID M1015 SAS/SATA Controller	1	22x, 32x, A2x, B2x
46M0832	9749	ServeRAID M1000 Series Advance Feature Key	1	-
46M0916	3877	ServeRAID M5014 SAS/SATA Controller	1	42x, 52x, C2x, D2x, F2x
46M0829	0093	ServeRAID M5015 SAS/SATA Controller	1	62x, 72x, 64x, G2x
46M0917	5744	ServeRAID M5000 Series Battery Kit	1	62x, 72x, 64x, G2x
46M0930	5106	ServeRAID M5000 Series Advanced Feature Key	1	-

The RAID controller in standard models is installed in PCIe slot 4 at the rear of the server (the top slot). Only one RAID controller can be used with the server to support internal HDDs. The two internal ports of the RAID card are connected to the backplane of the front hot-swap drive bays. The backplane incorporates a SAS expander to allow the single RAID card to support all internal drives.

The ServeRAID M1015 SAS/SATA Controller has the following specifications:

- Two Mini-SAS internal connectors
- Supports RAID levels 0, 1, 10
- Supports RAID levels 5 and 50 with optional ServeRAID M1000 Series Advanced Feature Key
- 6 Gbps throughput per port
- Based on the LSI SAS2008 6 Gbps RAID on Chip (ROC) controller
- PCI Express 2.0 x8 host interface
- Configurable stripe size up to 64 KB

The ServeRAID M5014 SAS/SATA Controller has the following specifications:

- Two Mini-SAS internal connectors
- Supports RAID levels 0, 1, 5, 10, and 50
- Supports RAID 6 and 60 with the optional M5000 Advanced Feature Key
- Performance optimization for SSD drives with optional M5000 Series Performance Accelerator Key
- 6 Gbps throughput per port
- PCI Express 2.0 x8 host interface
- Based on the LSI SAS2108 6 Gbps RAID on Chip (ROC) controller
- 256 MB of onboard cache
- Optional Intelligent Li-Ion-based battery backup unit with the ServeRAID M5000 Series Battery Kit

The ServeRAID M5015 SAS/SATA Controller has the following specifications:

- Two Mini-SAS internal connectors
- Supports RAID levels 0, 1, 5, 10, and 50
- Supports RAID 6 and 60 with the optional M5000 Advanced Feature Key
- Performance optimization for SSD drives with optional M5000 Series Performance Accelerator Key
- 6 Gbps throughput per port
- PCI Express 2.0 x8 host interface
- Based on the LSI SAS2108 6 Gbps RAID on Chip (ROC) controller
- 512 MB of onboard cache
- Standard Intelligent Li-Ion-based battery backup unit with up to 48 hours of data retention

For more information, see the list of IBM Redbooks® Product Guides in the RAID adapters category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=raid

Internal drive options

The following table lists hard drive options for internal disk storage in the x3630 M3. The mixing of SAS drives and SATA drives is supported by the server.

Table 7. Disk drive options (part 1)

Part number	Feature code	Description	Maximum supported
2.5-inch NL SATA HDD			
81Y9730	A1AV	IBM 1TB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	28
81Y9726	A1NZ	IBM 500GB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	28
42D0752	5407	IBM 500GB 7200 NL SATA 2.5" SFF Slim-HS HDD	28
81Y9722	A1NX	IBM 250GB 7.2K 6Gbps NL SATA 2.5" SFF HS HDD	28
2.5-inch NL SAS HDD			
81Y9690	A1P3	IBM 1TB 7.2K 6Gbps NL SAS 2.5" SFF HS HDD	28
90Y8953	A2XE	IBM 500GB 7.2K 6Gbps NL SAS 2.5" SFF G2HS HDD	28
42D0707	5409	IBM 500GB 7200 6Gbps NL SAS 2.5" SFF Slim-HS HDD	28
2.5-inch 15K SAS HDD			
81Y9670	A283	IBM 300GB 15K 6Gbps SAS 2.5" G2HS HDD	28
90Y8926	A2XB	IBM 146GB 15K 6Gbps SAS 2.5" SFF G2HS HDD	28
42D0677	5536	IBM 146GB 15K 6Gbps SAS 2.5" SFF Slim-HS HDD	28
2.5-inch 10K SAS HDD			
00AD075	A48S	IBM 1.2TB 10K 6Gbps SAS 2.5" G2HS HDD	28
81Y9650	A282	IBM 900GB 10K 6Gbps SAS 2.5" SFF HS HDD	28
90Y8872	A2XD	IBM 600GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	28
49Y2003	5433	IBM 600GB 10K 6Gbps SAS 2.5" SFF Slim-HS HDD	28
90Y8877	A2XC	IBM 300GB 10K 6Gbps SAS 2.5" SFF G2HS HDD	28
42D0637	5599	IBM 300GB 10K 6Gbps SAS 2.5" SFF Slim-HS HDD	28
2.5-inch self-encrypting drive (SED)			
00AD085	A48T	IBM 1.2TB 10K 6Gbps SAS 2.5" G2HS SED	28
81Y9662	A3EG	IBM 900GB 10K 6Gbps SAS 2.5" SFF G2HS SED	28
90Y8908	A3EF	IBM 600GB 10K 6Gbps SAS 2.5" SFF G2HS SED	28
90Y8913	A2XF	IBM 300GB 10K 6Gbps SAS 2.5" SFF G2HS SED	28
44W2264	5413	IBM 300GB 10K 6Gbps SAS 2.5" SFF Slim-HS SED	28
44W2294	5412	IBM 146GB 15K 6Gbps SAS 2.5" SFF Slim-HS SED	28
90Y8944	A2ZK	IBM 146GB 15K 6Gbps SAS 2.5" SFF G2HS SED	28

Table 7. Disk drive options (part 2)

Part number	Feature code	Description	Maximum supported
2.5-inch SAS-SSD hybrid drive			
00AD102	A4G7	IBM 600GB 10K 6Gbps SAS 2.5" G2HS Hybrid	28
2.5-inch Enterprise SSD			
49Y6195	A4GH	IBM 1.6TB SAS 2.5" MLC HS Enterprise SSD	28
00W1125	A3HR	IBM 100GB SATA 2.5" MLC HS Enterprise SSD	28
2.5-inch Enterprise Value SSD			
90Y8643	A2U3	IBM 256GB SATA 2.5" MLC HS Enterprise Value SSD	28
90Y8648	A2U4	IBM 128GB SATA 2.5" MLC HS Enterprise Value SSD	28
49Y5839	A3AS	IBM 64GB SATA 2.5" MLC HS Enterprise Value SSD	28
49Y5844	A3AU	IBM 512GB SATA 2.5" MLC HS Enterprise Value SSD	28
3.5-inch SATA HDDs			
43W7626	5560	IBM 1TB 7200 SATA 3.5" HS HDD	14
39M4530	5196	500GB 7200 RPM 3.5" Hot-Swap SATA II	14
3.5-inch NL SATA HDDs			
81Y9774	A27Z	IBM 3TB 7.2K 6Gbps NL SATA 3.5" HS HDD	14
42D0782	5415	IBM 2TB 7200 NL SATA 3.5" HS HDD	14
3.5-inch NL SAS HDDs			
81Y9758	A281	IBM 3TB 7.2K 6Gbps NL SAS 3.5" HS HDD	14
42D0767	5417	IBM 2TB 7.2K 6Gbps NL SAS 3.5" HS HDD	14
42D0777	5418	IBM 1TB 7.2K 6Gbps NL SAS 3.5" HS HDD	14
3.5-inch 15K SAS HDDs			
44W2234	5311	IBM 300GB 15K 6Gbps SAS 3.5" Hot-Swap HDD	14
44W2239	5312	IBM 450GB 15K 6Gbps SAS 3.5" Hot-Swap HDD	14
44W2244	5313	IBM 600GB 15K 6Gbps SAS 3.5" Hot-Swap HDD	14

Internal backup units

The server does not support internal tape drive options.

Optical drives

The server does not support internal optical drive options.

I/O expansion options

The server has two available PCI Express slots. One PCI Express x16 (x8 wired) Gen 2 slot is available, and one PCI Express x8 Gen 2 slot is dedicated to the RAID controller. The slot form-factors are as follows:

- Slot 3: Full-height, half-length
- Slot 4: Full-height, half-length (dedicated to the RAID Controller)

Note: There is no slot 1 or slot 2 in the x3630 M3. The system board includes an additional internal PCIe riser slot, but this slot is reserved.

Network adapters

The x3630 M3 has two integrated Gigabit Ethernet ports. Integrated NICs have the following features:

- Intel 82575 chip
- TCP/UDP, IPv4, and IPv6 checksum offloads
- TCP Segmentation/Transmit Segmentation Offloading (TSO)
- Wake on LAN support
- 802.1Q VLAN tagging support
- Support for jumbo frames up to 9 KBytes
- NIC teaming (load balancing and failover) with Intel PROSet software

The following table lists additional, supported network adapters.

Table 9. Network adapters

Part number	Feature code	Description	Maximum supported
10 Gb Ethernet			
42C1820*	1637	Brocade 10Gb CNA for IBM System x	1
49Y4250	5749	Emulex 10GbE Virtual Fabric Adapter for IBM System x	
49Y7950	A18Z	Emulex 10GbE Virtual Fabric Adapter II for IBM System x	1
95Y3751	A348	Emulex Dual Port VFAII Adapter & FCoE/iSCSI License for IBM System x	1
81Y9990	A1M4	Mellanox ConnectX-2 Dual Port 10GbE Adapter for IBM System x	1
42C1800	5751	QLogic 10Gb CNA for IBM System x	1
Gigabit Ethernet			
49Y7910	A18Y	Broadcom NetXtreme II Dual Port 10GBaseT Adapter for IBM System x	1
49Y4230	5767	Intel Ethernet Dual Port Server Adapter I340-T2 for IBM System x	1
49Y4240	5768	Intel Ethernet Quad Port Server Adapter I340-T4 for IBM System x	1
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter for IBM System x	1
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter for IBM System x	1
39Y6126	2944	PRO/1000 PT Dual Port Server Adapter by Intel	
42C1780	2995	NetXtreme II 1000 Express Dual Port Ethernet Adapter	1

* Withdrawn from marketing

For more information, see the list of IBM Redbooks Product Guides in the Networking adapters category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=networkadapters

Storage host bus adapters

The following table lists the storage adapters supported by x3630 M3 server.

Table 10. Storage adapters

Part number	Feature code	Description	Maximum supported
16 Gb Fibre Channel			
81Y1668	A2XU	Brocade 16Gb FC Single-port HBA for IBM System x	1
81Y1675	A2XV	Brocade 16Gb FC Dual-port HBA for IBM System x	1
81Y1655	A2W5	Emulex 16Gb FC Single-port HBA for IBM System x	1
81Y1662	A2W6	Emulex 16Gb FC Dual-port HBA for IBM System x	1
00Y3337	A3KW	QLogic 16Gb FC Single-port HBA for IBM System x	1
00Y3341	A3KX	Qlogic 16Gb FC Dual-port HBA for IBM System x	1
8 Gb Fibre Channel			
46M6050	3591	Brocade 8Gb FC Dual-port HBA for IBM System x	1
46M6049	3589	Brocade 8Gb FC Single-port HBA for IBM System x	1
42D0494	3581	Emulex 8Gb FC Dual-port HBA for IBM System x	1
42D0485	3580	Emulex 8Gb FC Single-port HBA for IBM System x	1
42D0510	3579	QLogic 8Gb FC Dual-port HBA for IBM System x	1
42D0501	3578	QLogic 8Gb FC Single-port HBA for IBM System x	1
4 Gb Fibre Channel			
59Y1993	3886	Brocade 4Gb FC Dual-port HBA for IBM System x	1
59Y1987	3885	Brocade 4Gb FC Single-port HBA for IBM System x	1
42C2071*	1699	Emulex 4Gb FC Dual-Port PCI-E HBA for IBM System x	1
42C2069*	1698	Emulex 4Gb FC Single-Port PCI-E HBA for IBM System x	1
SAS			
46M0907	5982	IBM 6 Gb SAS HBA Controller	1
46M0912	3876	IBM 6Gb Performance Optimized HBA	2

* Withdrawn from marketing

For more information, see the list of IBM Redbooks Product Guides in the Host bus adapters category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=hba

PCIe SSD adapters

The server supports the High IOPS SSD adapters listed in the following table.

Table 11. SSD adapters

Part number	Feature code	Description	Maximum support
81Y4535*	A1NE	320 GB High IOPS SLC Adapter For IBM System x	1
81Y4519*	5985	640 GB High IOPS MLC Duo Adapter For IBM System x	1
81Y4539*	A1ND	640 GB High IOPS SLC Duo Adapter For IBM System x	1

* Withdrawn from marketing

Power supplies

The server supports up to two redundant power supplies providing N+N redundancy. Most standard models come with one power supply. The following table lists the redundant power supply option available for the x3630 M3 server.

Table 12. Power supplies

Part number	Feature code	Description	Maximum supported	Standard models where used
69Y1213	4777	675 W Redundant Power Supply	2*	22Y, 32Y, 42Y, 52Y, 62Y, 72Y, A2x, B2x, C2x, D2x, F2x, 64x, G2x
81Y6557	A0ZG	IBM 675 W High Efficiency Redundant AC Power Supply	2*	C4x

* One power supply comes standard with every model. Model C4x includes two power supplies.

The AC power supply ships standard with one 2.8 m C13 - C14 power cord.

Integrated virtualization

The server supports VMware ESXi installed on a USB memory key. The key is installed in a USB socket inside the server. The following table lists the virtualization options.

Table 13. Virtualization options

Part number	Feature code	Description	Maximum supported
41Y8298	A2G0	IBM Blank USB Memory Key for VMware ESXi Downloads	1
41Y8278	1776	IBM USB Memory Key for VMware ESXi 4	1
41Y8287	3033	IBM USB Memory Key for VMware ESXi 4.1	1
41Y8296	A1NP	IBM USB Memory Key for VMware ESXi 4.1 Update 1	1
41Y8300	A2VC	IBM USB Memory Key for VMware ESXi 5.0	1
41Y8307	A383	IBM USB Memory Key for VMware ESXi 5.0 Update 1	1
41Y8311	A2R3	IBM USB Memory Key for VMware ESXi 5.1	1
41Y8382	A4WZ	IBM USB Memory Key for VMware ESXi 5.1 Update 1	1
41Y8385	A584	IBM USB Memory Key for VMware ESXi 5.5	1

Remote management

The server contains IBM Integrated Management Module (IMM), which provides advanced service-processor control, monitoring, and alerting functions. If an environmental condition exceeds a threshold or if a system component fails, the IMM lights LEDs to help you diagnose the problem, records the error in the event log, and alerts you to the problem. Optionally, the IMM also provides a virtual presence capability for remote server management capabilities.

The IMM provides remote server management through industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3
- Common Information Model (CIM)
- Web browser

The optional virtual media key is required to enable the remote presence and blue-screen capture features. The remote presence feature provides the following functions:

- Remotely viewing video with graphics resolutions up to 1280x1024 at 75 Hz, regardless of the system state
- Remotely accessing the server using the keyboard and mouse from a remote client
- Mapping the CD or DVD drive, diskette drive, and USB flash drive on a remote client, and mapping ISO and diskette image files as virtual drives that are available for use by the server
- Uploading a diskette image to the IMM memory and mapping it to the server as a virtual drive

The blue-screen capture feature captures the video display contents before the IMM restarts the server when the IMM detects an operating-system hang condition. A system administrator can use the blue-screen capture to assist in determining the cause of the hang condition.

The following table lists the remote management options.

Table 14. Remote management options

Part number	Feature code	Description	Maximum supported
46C7527	5891	IBM Virtual Media Key for Entry Systems	1

Supported operating systems

The server supports the following operating systems:

- Microsoft Windows Essential Business Server 2008 Premium Edition
- Microsoft Windows Essential Business Server 2008 Standard Edition
- Microsoft Windows Server 2003 R2 Datacenter Edition Unlimited Virtualization
- Microsoft Windows Server 2003 R2 x64 Datacenter Edition Unlimited Virtualization
- Microsoft Windows Server 2003/2003 R2, Datacenter Edition
- Microsoft Windows Server 2003/2003 R2, Datacenter x64 Edition
- Microsoft Windows Server 2003/2003 R2, Enterprise Edition
- Microsoft Windows Server 2003/2003 R2, Enterprise x64 Edition
- Microsoft Windows Server 2003/2003 R2, Standard Edition
- Microsoft Windows Server 2003/2003 R2, Standard x64 Edition
- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Microsoft Windows Small Business Server 2003/2003 R2 Premium Edition
- Microsoft Windows Small Business Server 2003/2003 R2 Standard Edition
- Microsoft Windows Small Business Server 2008 Premium Edition
- Microsoft Windows Small Business Server 2008 Standard Edition
- Red Hat Enterprise Linux 5 Server with Xen x64 Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- Red Hat Enterprise Linux 6 Server Edition
- Red Hat Enterprise Linux 6 Server x64 Edition
- SUSE LINUX Enterprise Server 10 with Xen for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for x86
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- VMware ESX 4.0
- VMware ESX 4.1
- VMware ESXi 4.0
- VMware ESXi 4.1
- VMware vSphere 5.0 (ESXi)
- VMware vSphere 5.1 (ESXi)
- VMware vSphere 5.5 (ESXi)

See the IBM ServerProven® website for the latest information about the specific versions and service levels supported and any other prerequisites:
http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/nos/matrix.shtml

Physical and electrical specifications

Dimensions:

- Width: 488 mm (19.2 in)
- Depth: 749 mm (29.5 in)
- Height: 87 mm (3.4 in)
- Weight
  - Minimum configuration: 16.20 kg (35.68 lb)
  - Maximum configuration: 29.20 kg (64.32 lb)

Operating environment:

- Air temperature
  - Server on
    - 10 - 35° C (50 - 95° F); altitude: 0 - 915 m (3,000 ft)
    - 10 - 32° C (50 - 90° F); altitude: 915 - 2,134 m (3,000 - 7,000 ft)
    - 10 - 28° C (50 - 83° F); altitude: 2,134 - 3,050 m (7,000 - 10,000 ft)
  - Server off: 5 - 45° C (41 - 113° F)
  - Shipment: -40 - 60° C (-40 - 140° F)
- Humidity
  - Server on: 20 - 80%, max dew point 21° C, max rate of change 5° C/hr
  - Server off: 8 - 80%, max dew point 27° C
  - Shipment: 5 - 100%
- Electrical
  - 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 7.8 A
  - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 3.8 A
  - Input kilovolt-amperes (kVA) (approximately):
    - Minimum configuration: 0.22 kVA
    - Maximum configuration: 0.78 kVA
  - Btu output
    - Minimum configuration: 762 Btu/hr (223 watts)
    - Maximum configuration: 2662 Btu/hr (780 watts)
  - Acoustical noise level emission level: Sound power levels
    - 6.1 bels (idling)
    - 6.1 bels (operating)

Warranty options

The IBM System x3630 M3 has a 3-year onsite warranty with 9x5/next-business-day terms. IBM offers warranty service upgrades through IBM ServicePacs. The IBM ServicePac is a series of prepackaged warranty maintenance upgrades and post-warranty maintenance agreements with a well-defined scope of services, including service hours, response time, and term of service and service agreement terms and conditions.

IBM ServicePac offerings are country-specific. That is, each country might have its own service types, service levels, response times, and terms and conditions. Not all covered types of ServicePacs might be available in particular country. For more information about IBM ServicePac offerings available in your country, see the IBM ServicePac Product Selector at:
https://www-304.ibm.com/sales/gss/download/spst/servicepac.

In general, the types of IBM ServicePacs are:

- Warranty and maintenance service upgrades
  - One, 2, 3, 4, or 5 years of 9x5 or 24x7 service coverage
  - Onsite repair from next business day to 4 or 2 hours (selected areas)
  - One or 2 years of warranty extension
- Remote technical support services
  - One or 3 years with 24x7 coverage (severity 1) or 9x5/next business day for all severities
  - Installation and startup support for System x® servers
  - Remote technical support for System x servers
  - Software support - Support Line
    - Microsoft or Linux software
    - VMware
    - IBM Systems Director

The following table explains warranty service definitions in more detail.

Table 15. Warranty service definitions

Term	Description
IBM onsite repair (IOR)	A service technician will come to the server's location for equipment repair.
24x7x2 hour	A service technician is scheduled to arrive at your customer’s location within two hours after remote problem determination is completed. We provide service around the clock, every day, including IBM holidays.
24x7x4 hour	A service technician is scheduled to arrive at your customer’s location within four hours after remote problem determination is completed. We provide service around the clock, every day, including IBM holidays.
9x5x4 hour	A service technician is scheduled to arrive at your customer’s location within four business hours after remote problem determination is completed. We provide service from 8:00 a.m. to 5:00 p.m. in the customer's local time zone, Monday through Friday, excluding IBM holidays. If after 1:00 p.m. it is determined that onsite service is required, the customer can expect the service technician to arrive the morning of the following business day. For noncritical service requests, a service technician will arrive by the end of the following business day.
9x5 next business day	A service technician is scheduled to arrive at your customer’s location on the business day after we receive your call, following remote problem determination. We provide service from 8:00 a.m. to 5:00 p.m. in the customer's local time zone, Monday through Friday, excluding IBM holidays.

Regulatory compliance

The server conforms to the following international standards:

- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 69950-1-03
- NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22:2009, Class A
- IEC-60950-1:2001 (CB Certificate and CB Test Report)
- Taiwan BSMI CNS 13438, Class A; CNS 14336
- China CCC (4943-2001), GB 9254-2008 Class A, GB 17625.1:2003
- Korea KN22, Class A; KN24
- Russia/GOST ME01, IEC-60950-1, GOST R 51318.22-99, GOST R 51318.24-99, GOST R 51317.3.2-2006, GOST R 51317.3.3-99
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- TUV-GS (EN60950-1 /IEC60950-1,EK1-ITB2000)

External disk storage expansion

The external disk storage expansion enclosures listed in the following table are available.

Table 16. External storage expansion enclosures

Part number	Description	Maximum quantity supported per one M5025
172701X	IBM System Storage® EXP3000	18 (9 per port)
1746A4D	IBM System Storage DS3524 Express Dual Controller Storage System	-
1746A4S	IBM System Storage DS3524 Express Single Controller Storage System	-
1746A2D	IBM System Storage DS3512 Express Dual Controller Storage System	-
1746A2S	IBM System Storage DS3512 Express Single Controller Storage System	-

The hard disk drives listed in the following table are supported with external expansion enclosures.

Table 17. Hard drive options for external expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
EXP3000 Hot-Swap SATA 3.5" Hard Drives		
43W7630	1000 GB Dual Port Hot Swap SATA	12
49Y1940	IBM 2 TB 7200 Dual Port SATA 3.5" HS HDD	12
EXP3000 Hot-Swap SAS 3.5" Hard Drives		
44W2234	IBM 300 GB 15K 6 Gbps SAS 3.5" Hot-Swap HDD	12
44W2239	IBM 450 GB 15K 6 Gbps SAS 3.5" Hot-Swap HDD	12
44W2244	IBM 600 GB 15K 6 Gbps SAS 3.5" Hot-Swap HDD	12

The ServeRAID M5025 RAID controller listed in the following table are supported and connect to external expansion enclosures.

Table 18. RAID controllers for external storage expansion enclosures

Part number	Description	Maximum quantity supported
46M0830	ServeRAID M5025 SAS/SATA Controller	1
46M0930	ServeRAID M5000 Series Advance Feature Key*	1 per one M5025
81Y4426	ServeRAID M5000 Series Performance Accelerator Key*	1 per one M5025

* Note: The Advanced Feature Key and Performance Accelerator Key cannot be used at the same time. Only one key can be installed onto the RAID controller.

The ServeRAID M5025 SAS/SATA Controller has the following specifications:

- Two Mini-SAS external connectors
- Supports RAID levels 0, 1, 5, 10, and 50
- Supports RAID 6 and 60 with the optional M5000 Advanced Feature Key
- Performance optimization for SSD drives with optional M5000 Series Performance Accelerator Key
- 6 Gbps throughput per port
- PCI Express 2.0 x8 host interface
- Based on the LSI SAS2108 6 Gbps ROC controller
- 512 MB of onboard cache
- Intelligent Li-Ion-based battery backup unit with up to 48 hours of data retention
- Supports connectivity to the EXP3000, EXP2512, and EXP2524 storage expansion enclosures

For more information about the M5025, see the *ServeRAID M5025 SAS/SATA Controller for IBM System x* at-a-glance guide: http://www.redbooks.ibm.com/abstracts/tips0739.html?Open

The external SAS cables listed in the following table are supported with external expansion enclosures and M5025 RAID controllers.

Table 19. External SAS cables for external storage expansion enclosures

Part number	Description	Maximum quantity supported per enclosure*
39R6531	IBM 3 m SAS Cable	1
39R6529	IBM 1 m SAS Cable	1

* Note: The EXP3000 series can be chained with each other. In such a case, one cable is used to connect first EXP3000 to the RAID controller, and every consecutive EXP unit is connected to previous one by one cable.

External disk storage systems

The following table lists the external storage systems that are supported by the server and can be ordered through System x sales channel. The server may support other IBM disk systems that are not listed in this table. Refer to IBM System Storage Interoperability Center for further information, http://www.ibm.com/systems/support/storage/ssic.

Table 20. External disk storage systems

Part number	Description
1746A2D	IBM System Storage DS3512 Express Dual Controller Storage System
1746A2S	IBM System Storage DS3512 Express Single Controller Storage System
1746A4D	IBM System Storage DS3524 Express Dual Controller Storage System
1746A4S	IBM System Storage DS3524 Express Single Controller Storage System
181494H	IBM System Storage DS3950 Model 94
181498H	IBM System Storage DS3950 Model 98
181492H	IBM System Storage EXP395 Expansion Unit
1746A2E	IBM System Storage EXP3512 Express Storage™ Expansion Unit
1746A4E	IBM System Storage EXP3524 Express Storage Expansion Unit

For more information, see the list of IBM Redbooks Product Guides in the Storage Systems category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=externalstorage

External backup units

The server supports the external backup attachment options listed in the following table.

Table 21. External backup options (Part 1)

Part number	Description
External tape expansion enclosures for internal tape drives	
87651UX	1U Tape Drive Enclosure
8767HHX	Half High Tape Drive Enclosure
87651NX	1U Tape Drive Enclosure (with Nema 5-15P LineCord)
8767HNX	Half High Tape Drive Enclosure (with Nema 5-15P LineCord)
Tape enclosure adapters (with cables)	
44E8869	USB Enclosure Adapter Kit
40K2599	SAS Enclosure Adapter Kit
Internal backup drives supported by external tape enclosures	
46C5364	IBM RDX Removable Hard Disk Storage System - Internal USB 160 GB Bundle
46C5387	IBM RDX Removable Hard Disk Storage System - Internal USB 320 GB Bundle
46C5388	IBM RDX Removable Hard Disk Storage System - Internal USB 500 GB Bundle
46C5399	IBM DDS Generation 5 USB Tape Drive
39M5636	IBM DDS Generation 6 USB Tape Drive
43W8478	IBM Half High LTO Gen 3 SAS Tape Drive
44E8895	IBM Half High LTO Gen 4 SAS Tape Drive
49Y9898	IBM Half High LTO Gen 5 Internal SAS Tape Drive

Table 21. External backup options (Part 2)

Part number	Description
External backup units*	
362516X	IBM RDX Removable Hard Disk Storage System - External USB 160 GB Bundle
362532X	IBM RDX Removable Hard Disk Storage System - External USB 320 GB Bundle
362550X	IBM RDX Removable Hard Disk Storage System - External USB 500 GB Bundle
3628L3X	IBM Half High LTO Gen 3 External SAS Tape Drive (with US line cord)
3628L4X	IBM Half High LTO Gen 4 External SAS Tape Drive (with US line cord)
3628L5X	IBM Half High LTO Gen 5 External SAS Tape Drive (with US line cord)
3628N3X	IBM Half High LTO Gen 3 External SAS Tape Drive (without line cord)
3628N4X	IBM Half High LTO Gen 4 External SAS Tape Drive (without line cord)
3628N5X	IBM Half High LTO Gen 5 External SAS Tape Drive (without line cord)
3580S3V	System Storage TS2230 Tape Drive Express Model H3V
3580S4V	System Storage TS2240 Tape Drive Express Model H4V
3580S5E	System Storage TS2250 Tape Drive Express Model H5S
3580S5X	System Storage TS2350 Tape Drive Express Model S53
3572S4R	TS2900 Tape Library with LTO4 HH SAS drive & rack mount kit
3572S5R	TS2900 Tape Library with LTO5 HH SAS drive & rack mount kit
35732UL	TS3100 Tape Library Model L2U Driveless
35734UL	TS3200 Tape Library Model L4U Driveless
46X2682†	LTO Ultrium 5 Fibre Channel Drive
46X2683†	LTO Ultrium 5 SAS Drive Sled
46X2684†	LTO Ultrium 5 Half High Fibre Drive Sled
46X2685†	LTO Ultrium 5 Half High SAS Drive Sled
46X6912†	LTO Ultrium 4 Half High Fibre Channel Drive Sled
46X7117†	LTO Ultrium 4 Half High SAS DriveV2 Sled
46X7122†	LTO Ultrium 3 Half High SAS DriveV2 Sled

* Note: The external tape drives listed can be ordered through System x sales channel. Server may support other IBM tape drives that are not listed in this table. Refer to IBM System Storage Interoperability Center for further information.
† Note: These part numbers are the tape drives options for 35732UL and 35734UL.

For more information, see the list of IBM Redbooks Product Guides in the Backup units category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=tape

Top-of-rack Ethernet switches

The server supports the top-of-rack Ethernet switches from IBM System Networking listed in the following table.

Table 22. IBM System Networking - Top-of-rack switches

Part number	Description
IBM System Networking - 1 Gb top-of-rack switches	
0446013	IBM System Networking RackSwitch G8000R
7309CFC	IBM System Networking RackSwitch G8000F
7309CD8	IBM System Networking RackSwitch G8000DC
7309G52	IBM System Networking RackSwitch G8052R
730952F	IBM System Networking RackSwitch G8052F
427348E	IBM Ethernet Switch J48E
6630010	Juniper Networks EX2200 24 Port
6630011	Juniper Networks EX2200 24 Port with PoE
6630012	Juniper Networks EX2200 48 Port
6630013	Juniper Networks EX2200 48 Port with PoE
IBM System Networking - 10 Gb top-of-rack switches	
7309DRX	IBM System Networking RackSwitch G8264CS (Rear to Front)
7309DFX	IBM System Networking RackSwitch G8264CS (Front to Rear)
7309BD5	IBM System Networking RackSwitch G8124DC
7309BR6	IBM System Networking RackSwitch G8124ER
7309BF7	IBM System Networking RackSwitch G8124EF
7309G64	IBM System Networking RackSwitch G8264R
730964F	IBM System Networking RackSwitch G8264F
7309CR9	IBM System Networking RackSwitch G8264TR
7309CF9	IBM System Networking RackSwitch G8264TF
0719410	Juniper Networks EX4500 - Front to Back Airflow
0719420	Juniper Networks EX4500 - Back to Front Airflow
IBM System Networking - 40 Gb top-of-rack switches	
8036BRX	IBM System Networking RackSwitch G8332 (Rear to Front)
8036BFX	IBM System Networking RackSwitch G8332 (Front to Rear)
8036ARX	IBM System Networking RackSwitch G8316R
8036AFX	IBM System Networking RackSwitch G8316F

For more information, see the list of IBM Redbooks Product Guides in the Top-of-rack switches category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=tor

Uninterruptible power supply units

The server supports attachments to the uninterruptible power supply (UPS) units listed in the following table.

Table 23. Uninterruptible power supply units

Part number	Description
Rack-mounted UPS	
21304RX	IBM UPS 10000XHV
53951AX	IBM 1500VA LCD 2U Rack UPS (100V/120V)
53951KX	IBM 1500VA LCD 2U Rack UPS (230V)
53952AX	IBM 2200VA LCD 2U Rack UPS (100V/120V)
53952KX	IBM 2200VA LCD 2U Rack UPS (230V)
53953AX	IBM 3000VA LCD 3U Rack UPS (100 V/120 V)
53953JX	IBM 3000VA LCD 3U Rack UPS (200 V/208 V)
53956AX	IBM 6000VA LCD 4U Rack UPS (200 V/208 V)
53956KX	IBM 6000VA LCD 4U Rack UPS (230 V)

For more information, see the list of IBM Redbooks Product Guides in the Power infrastructure category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=power

Power distribution units

The server supports attachments to the power distribution units (PDUs) listed in the following table.

Table 24. Power distribution units (part 1)

Part number	Description
Switched and Monitored PDUs	
46M4002	IBM 1U 9 C19/3 C13 Active Energy Manager DPI® PDU
46M4003	IBM 1U 9 C19/3 C13 Active Energy Manager 60A 3 Phase PDU
46M4004	IBM 1U 12 C13 Active Energy Manager DPI PDU
46M4005	IBM 1U 12 C13 Active Energy Manager 60A 3 Phase PDU
46M4167	IBM 1U 9 C19/3 C13 Switched and Monitored 30A 3 Phase PDU
46M4116	IBM 0U 24 C13 Switched and Monitored 30A PDU
46M4119	IBM 0U 24 C13 Switched and Monitored 32A PDU
46M4134	IBM 0U 12 C19/12 C13 Switched and Monitored 50A 3 Phase PDU
46M4137	IBM 0U 12 C19/12 C13 Switched and Monitored 32A 3 Phase PDU
Enterprise PDUs	
71762MX	IBM Ultra Density Enterprise PDU C19 PDU+ (WW)
71762NX	IBM Ultra Density Enterprise PDU C19 PDU (WW)
71763MU	IBM Ultra Density Enterprise PDU C19 3 phase 60A PDU+ (NA)
71763NU	IBM Ultra Density Enterprise PDU C19 3 phase 60A PDU (NA)
39M2816	IBM DPI C13 Enterprise PDU without linecord
39Y8923	DPI 60A Three Phase C19 Enterprise PDU with IEC309 3P+G (208 V) fixed line cord
39Y8941	DPI Single Phase C13 Enterprise PDU without line cord
39Y8948	DPI Single Phase C19 Enterprise PDU without line cord
Front-End PDUs	
39Y8934	DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd connector
39Y8935	DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd connector
39Y8938	30amp/125V Front-end PDU with NEMA L5-30P connector
39Y8939	30amp/250V Front-end PDU with NEMA L6-30P connector
39Y8940	60amp/250V Front-end PDU with IEC 309 60A 2P+N+Gnd connector

Table 24. Power distribution units (part 2)

Part number	Description
Universal PDUs	
39Y8951	DPI Universal Rack PDU w/ US LV and HV line cords
39Y8952	DPI Universal Rack PDU w/ CEE7-VII Europe LC
39Y8953	DPI Universal Rack PDU w/ Denmark LC
39Y8954	DPI Universal Rack PDU w/ Israel LC
39Y8955	DPI Universal Rack PDU w/Italy LC
39Y8956	DPI Universal Rack PDU w/South Africa LC
39Y8957	DPI Universal Rack PDU w/UK LC
39Y8958	DPI Universal Rack PDU with AS/NZ LC
39Y8959	DPI Universal Rack PDU w/China LC
39Y8962	DPI Universal Rack PDU (Argentina)
39Y8960	DPI Universal Rack PDU (Brazil)
39Y8961	DPI Universal Rack PDU (India)
0U Basic PDUs	
46M4122	IBM 0U 24 C13 16A 3 Phase PDU
46M4125	IBM 0U 24 C13 30A 3 Phase PDU
46M4128	IBM 0U 24 C13 30A PDU
46M4131	IBM 0U 24 C13 32A PDU
46M4140	IBM 0U 12 C19/12 C13 60A 3 Phase PDU
46M4143	IBM 0U 12 C19/12 C13 32A 3 Phase PDU

For more information, see the list of IBM Redbooks Product Guides in the Power infrastructure category: http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=power

Rack cabinets

The server supports the rack cabinets listed in the following table. The Tower-to-Rack Conversion Kit (part number 42C8923, 5Ux20" Tower to Rack Conversion Kit for x3200) is required for the server to be installed in the rack.

Table 25. Rack cabinets

Part number	Description
201886X	IBM 11U Office Enablement Kit
93072PX	IBM 25U Static S2 Standard Rack
93072RX	IBM 25U Standard Rack
14102RX	IBM 25RU standard rack
14104RX	IBM 42U S2 standard rack
93074RX	IBM 42U Standard Rack
93074XX	IBM 42U Standard Rack Extension
93084EX	IBM 42U Enterprise Expansion Rack
93084PX	IBM 42U Enterprise Rack
93604EX	IBM 42U 1200 mm Deep Dynamic Expansion Rack
93604PX	IBM 42U 1200 mm Deep Dynamic Rack
93614EX	IBM 42U 1200 mm Deep Static Expansion Rack
93614PX	IBM 42U 1200 mm Deep Static Rack
93624EX	IBM 47U 1200 mm Deep Static Expansion Rack
93624PX	IBM 47U 1200 mm Deep Static Rack

For more information, see the list of IBM Redbooks Product Guides in the Rack cabinets and options category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=rack

Rack options

The server supports the rack console switches and monitor kits listed in the following table.

Table 26. Rack options

Part number	Feature code	Description
Monitor kits and keyboard trays		
17238BX	1723HC1 fc A3EK	IBM 1U 18.5" Standard Console
17238EX	1723HC1 fc A3EL	IBM 1U 18.5" Enhanced Media Console
172317X	1723HC1 fc 0051	1U 17in Flat Panel Console Kit
172319X	1723HC1 fc 0052	1U 19in Flat Panel Console Kit
Console switches		
3858D3X	3858HC1 fc A4X1	Avocent Universal Management Gateway 6000 for IBM
1754D2X	1754HC2 fc 6695	IBM Global 4x2x32 Console Manager (GCM32)
1754D1X	1754HC1 fc 6694	IBM Global 2x2x16 Console Manager (GCM16)
1754A2X	1754HC4 fc 0726	IBM Local 2x16 Console Manager (LCM16)
1754A1X	1754HC3 fc 0725	IBM Local 1x8 Console Manager (LCM8)
Console cables		
00AK142	A4X4	UM KVM Module VGA+SD Dual RJ45
43V6147	3757	IBM Single Cable USB Conversion Option (UCO)
39M2895	3756	IBM USB Conversion Option (4 Pack UCO)
39M2897	3754	IBM Long KVM Conversion Option (4 Pack Long KCO)
46M5383	5341	IBM Virtual Media Conversion Option Gen2 (VCO2)
46M5382	5340	IBM Serial Conversion Option (SCO)

For more information, see the list of IBM Redbooks Product Guides in the Rack cabinets and options category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=rack

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Related publications and links

For more information see the following documents:

- IBM System x3630 M3 product page
  http://www.ibm.com/systems/x/hardware/rack/x3630m3/
- *Installation and User's Guide - IBM System x3630 M3*
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5085552
- *Problem Determination and Service Guide - IBM System x 3630 M3*
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5085553
- ServerProven hardware compatibility page for the x3630 M3
  http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/xseries/7377.html
- Product Guides for IBM System x options
  http://www.redbooks.ibm.com/portals/systemx?Open&page=ataglance
- *IBM System x® Configuration and Options Guide*
  http://www.ibm.com/systems/xbc/cog/
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